

Acid Base Intro Notes

Definitions:

1) Arrhenius:

An acid produces H^+ (_____) in a water solution

A base produces OH^- in solution

Note: H^+ will combine with water to form H_3O^+ (_____)

2) Bronsted-Lowery:

An acid is a proton donor (_____)

A base is a proton acceptor

Examples:

Rules for Naming Acids:

Binary Acids (only 2 elements):

- 1) Use the prefix **HYDRO**
- 2) Modify the name of the anion to end in **IC**

Examples:

Ternary Acids (contain a polyatomic ion):

- 1) Use the stem of the polyatomic ion
- 2) If the polyatomic ion ends in -ate drop the -ate and add ic
- 3) If the polyatomic ion ends in -ite drop the -ite and add ous
- 4) If the polyatomic ion has less oxygen than the -ite use the prefix hypo and the suffix ous
- 5) If the polyatomic ion has more oxygen than the -ate use the prefix per and the suffix ic

Examples:

Properties of Acids and Bases

Acids:

- 1) produce H^+ in water
- 2) taste sour
- 3) turns litmus red
- 4) pH less than 7
- 5) neutralize bases
- 6) react with metals to produce H_2
- 7) React with carbonate compounds to make CO_2 gas

Properties of Bases:

- 1) Produce OH^- in water
- 2) taste bitter
- 3) turn litmus blue
- 4) pH more than 7
- 5) neutralize acids
- 6) feel slippery

Acid Strength:

Strong acids ionize 100% to produce H_3O^+

Weak acids only ionize to a small extent

List of strong acids:

HCl , HBr , HI , HClO_3 , HClO_4 , HNO_3 , H_2SO_4

Examples:

Base Strength:

Strong bases ionize 100% to produce OH^-

Weak bases only ionize to a small extent

Rules for finding a strong base:

Family 1A make strong bases

Family 2A make strong bases

All the rest are weak

Examples:

Calculating pH:

pH is a measure of the $[\text{H}_3\text{O}^+]$

pH scale:

Pure water has a $\text{pH} = 7$, which means that $[\text{OH}^-]$ and $[\text{H}_3\text{O}^+]$ are equal

Note: pH 2 is 10 times more acidic than pH 3

$$\text{pH} = -\log[\text{H}_3\text{O}^+]$$

Problems:

What is the pH if $[\text{H}^+]$ is 0.0010M?

What is the pH if $[\text{H}^+]$ is 0.0025M?

What is the pH of a 0.20M solution of HCl? (strong acid)